

# Composites of Ti-Al Intermetallic Compounds With a Ductile Ti Matrix, Phase I

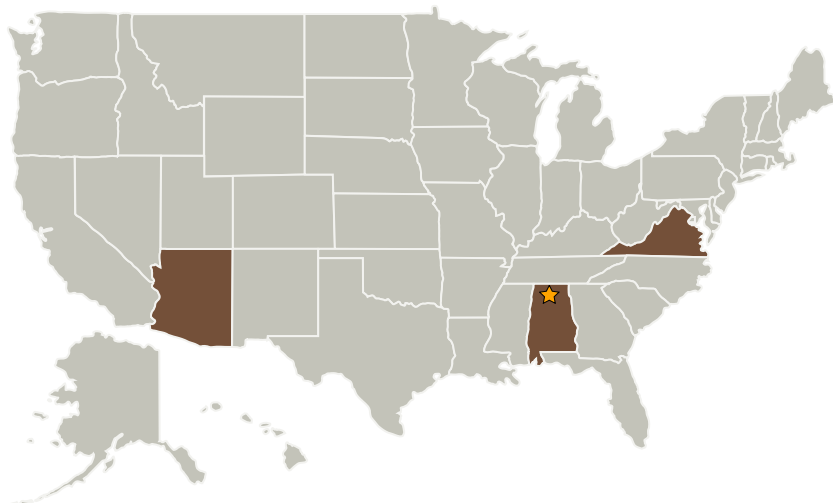
Completed Technology Project (2005 - 2005)



## Project Introduction

Many properties of intermetallic compounds (IMC's) would make them strong candidates for vehicle structures, tankage, secondary structures, and appendages for NASA exploration systems. This includes excellent specific strength, creep, and oxidation resistance. However, the lack of ductility in these IMC's generally does not allow these materials to meet the design requirements for those vehicle structures. On the other hand, base alloys themselves, such as Ti-6Al-4V or Inconel, have sufficient ductility, but do not have the other desired attributes. Using a novel fabrication technique (plasma transferred arc solid free form fabrication, or PTA SFFF), MER will develop composite materials of IMC's with a strong, ductile base metal. These composite materials will have a combination of overall properties that cannot be obtained today in an IMC structure. The PTA SFFF process has the capability to scale up these composites to the large shapes required for vehicle structures.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Marshall Space Flight Center (MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
MER Corporation	Supporting Organization	Industry	Tucson, Arizona



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Marshall Space Flight Center (MSFC)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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## Primary U.S. Work Locations

Alabama

Arizona

Virginia

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

### Project Manager:

Lesa B Roe

### Principal Investigators:

Robert Cabana

James C Withers

## Technology Areas

### Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - └ TX12.1 Materials
    - └ TX12.1.1 Lightweight Structural Materials